

Name: \_\_\_\_\_

Teacher: \_\_\_\_\_

Algebra Pd: \_\_\_\_\_

### 3.9: Exponential Decay

\_\_\_\_\_  
*Day      Month      Year*

**1. The population of squirrels in a city is decreasing at an annual rate of 9.8% as they decide to live in a forest. If there are 7,839 squirrels living in the city today, how many squirrels will be in the city in 2026?**

a. Write the GENERAL equation for exponential decay.

b. What is the initial amount of squirrels?

c. What is the the decay factor as a decimal?

d. How many time periods pass by?

e. Use the the exponential decay formula and your answers from b, c, and d to calculate the number of squirrels in the city in 2026.

**2. The half-life of Paulonium is 7 days. If there are 765 grams of Paulonium now, how many grams will be present in 35 days?**

a. Write the GENERAL equation for exponential decay.

b. What is the initial amount of **Paulonium**?

c. What is the the decay factor?

d. How many half-lives are in 35 days?

e. Use the the exponential decay formula and your answers from b, c, and d to calculate your answer.

**3. Please answer as specifically as possible. Use complete sentences and algebraic terms. Avoid vague words.**

What is the difference between finding the base of the exponent in an exponential growth problem versus an exponential decay problem when giving an initial percentage? Why is this the case?

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**4. The Situation:** The value of a new car depreciates at a rate of 12% annually. If a 2016 car costs \$42,599, what is the value of the car in 2019? Round to the nearest cent.

a. Write the GENERAL equation for exponential decay.

b. What is the initial value of the car?

c. What is the decay factor as a decimal?

d. How many time periods pass by?

e. Use the exponential decay formula and your answers from b, c, and d to calculate the value of the car in 2019.

**5. Write an original word problem that can be modeled by an exponential decay function.**

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